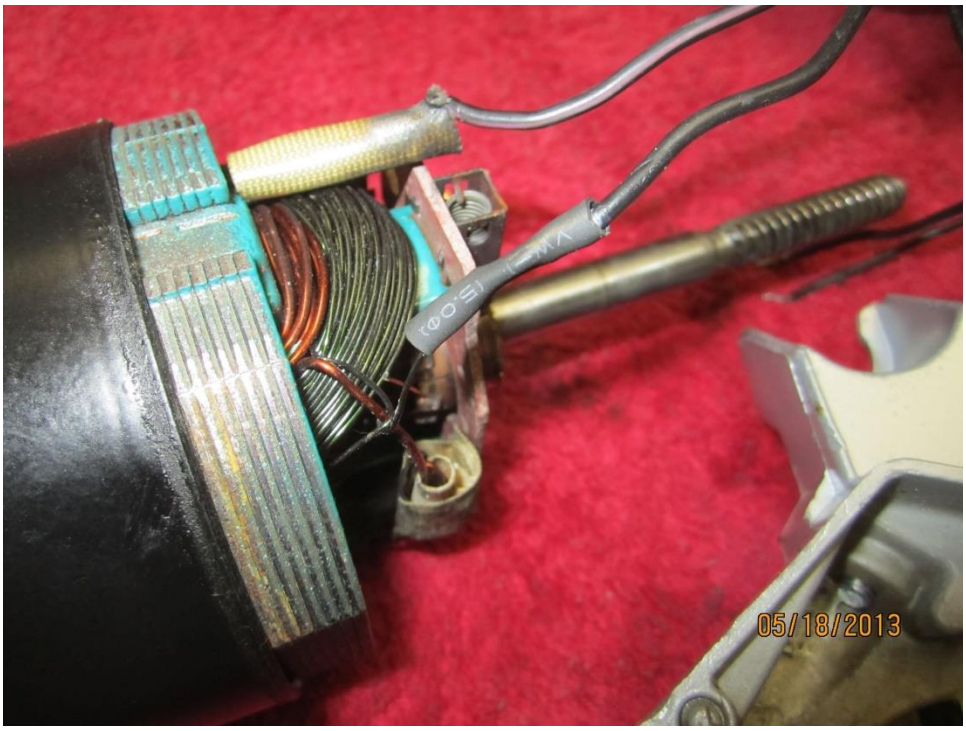
Wiper Motor - basic re-assembly

I found several good trouble-shooting write-ups and video on testing wiper motors but since mine was all apart and never worked 100% in the first place
Just for the next poor fellow who's wiper motor is totally apart.

This was on my 72, not 100% sure it's the correct motor/pump, might be off a Mack truck or something. (Still looking for a barrel connector pump)

Back off the linear adjusting screw to get it out of the way

Check and make sure the wires are joined securely, I added a small heat-shrink here for added strength



Grease the inside bearing where the worn shaft goes through with a light grease (white grease works well)

Feed the two wires out of the hole and keep pulling them through as you slide the armature into place.

Careful not to pinch the wires.
Align the two long screws and lightly snug them

Now is a good time to test the motor JIC
Ground the case and touch 12+ to the black wire with the pink stripe will spin the motor.
If the armature spins slow, try tapping it with a small rubber mallet to help align the bearing.
If it doesn't spin at all, carefully try to turn the armature with a pair of needle nose pliers. If it spins, pull the armature back apart and check the brushes, bad connections, etc. Wash everything with some contact cleaner and try again. You may have a burnt out set of windings

When it's working, slide on the rubber seal keeping the wires pulled out snug

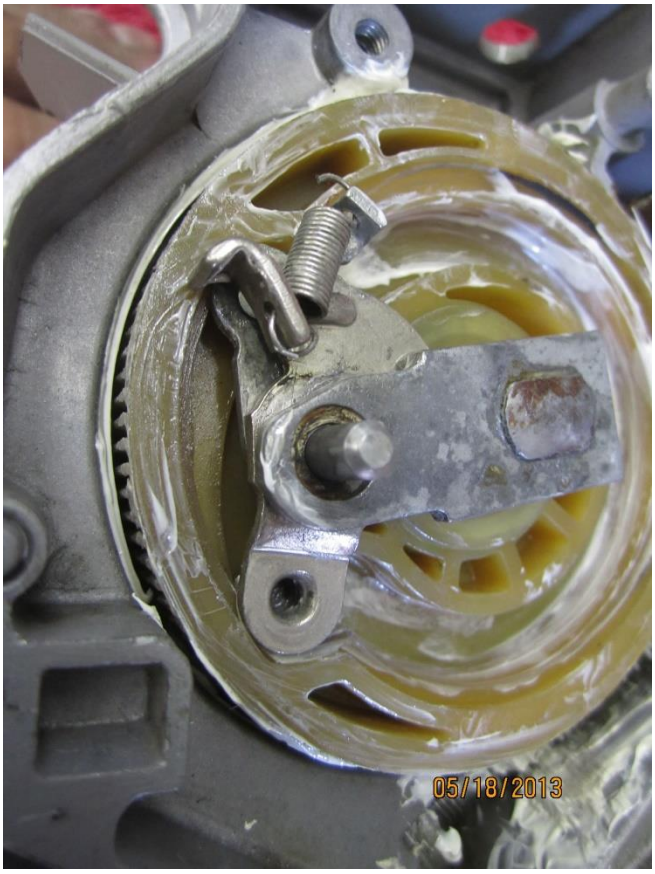
Grease and drop in the main gear. There should be a thin spacer washer between the gear and the housing

Grease in inside of the bushings and put some extra in the cavity between them

Run a light coat of grease over the outside of the gear and the worm

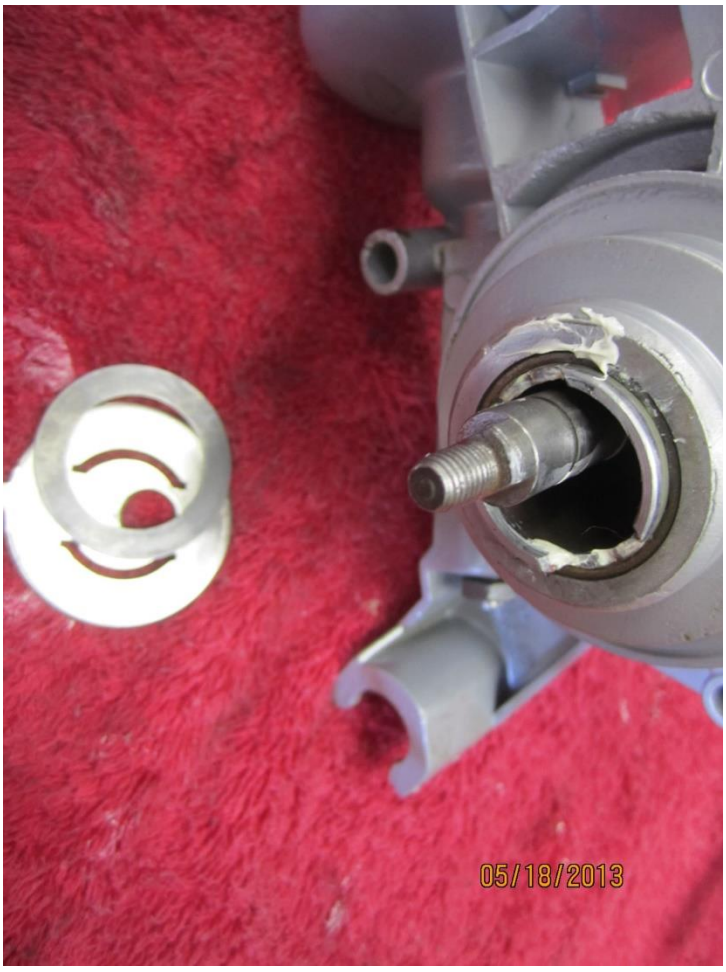
Run the motor for a minute and bring in the adjuster screw until it light loads the worm, you'll actually hear the motor smooth out, if you run it in too far it will slow again. Tighten the lock nut

The center shaft is in three pieces, the shaft, follower cam and stop cam. They stack together with the shoulder on the stop-cam locating the follower cam into the arm on the shaft

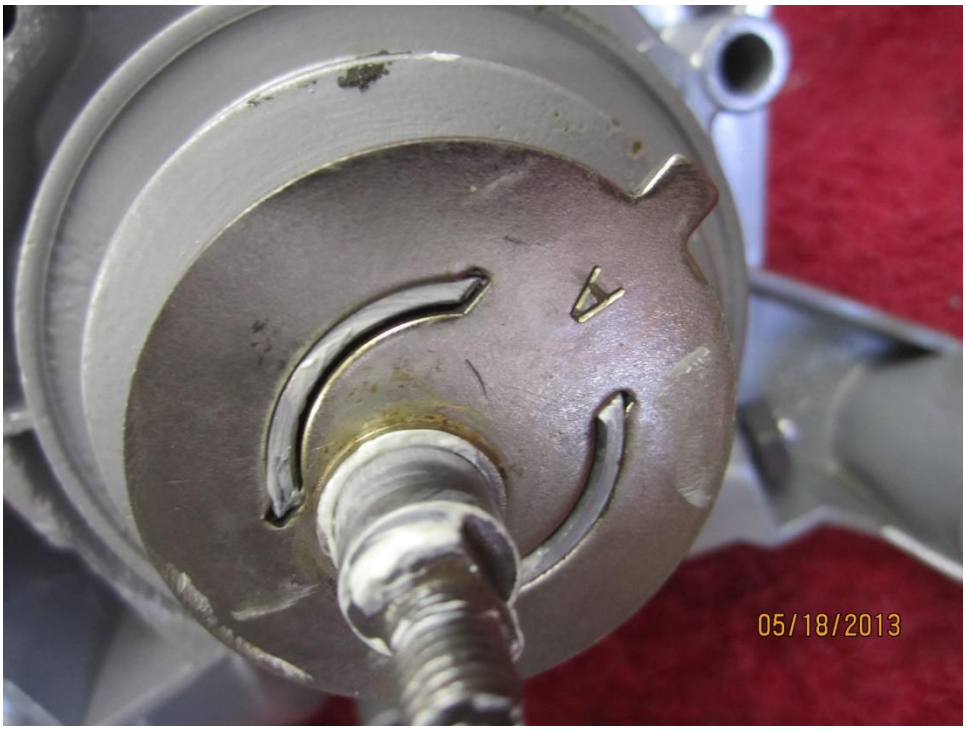


Make sure the three parts are stacked and sitting down together properly (the middle lever has the large hole that must be centered on the pin from the bottom one)

Turning everything over, there is a plate with another thin washer



Washer goes against the housing, then the plate aligns with the two arcs

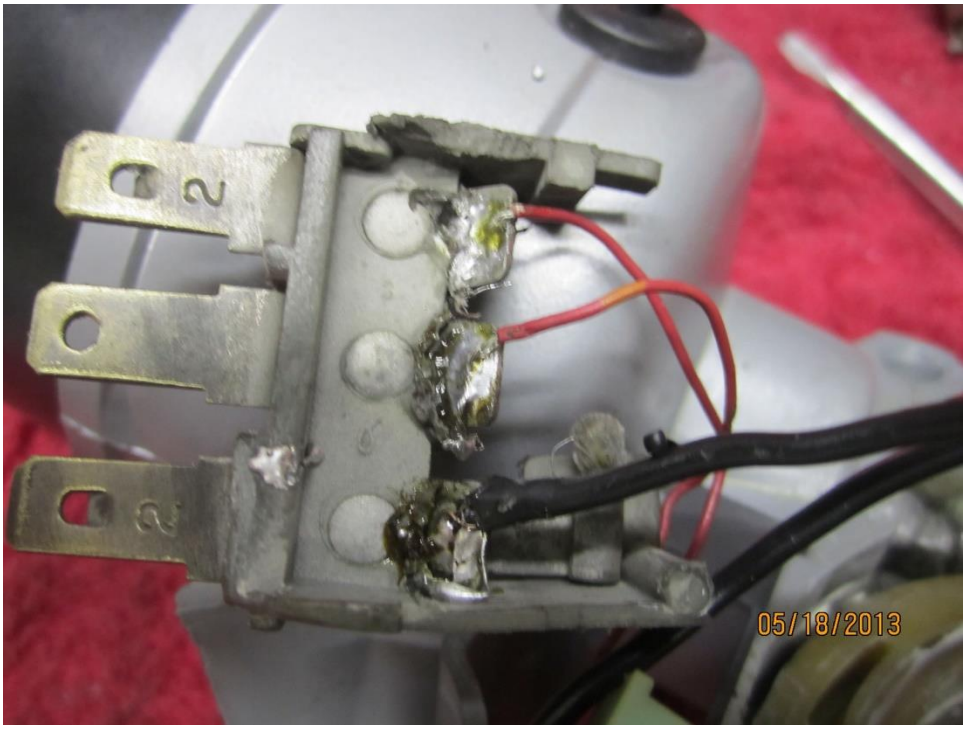


The plate had a shoulder sticking out around the shaft hole, that goes to the outside (away from the housing)
Now comes a spacer (looks like bronze) and a c-clip

Mine also had a thin steel washer between the spacer and the plate, no mention of this in the manuals.

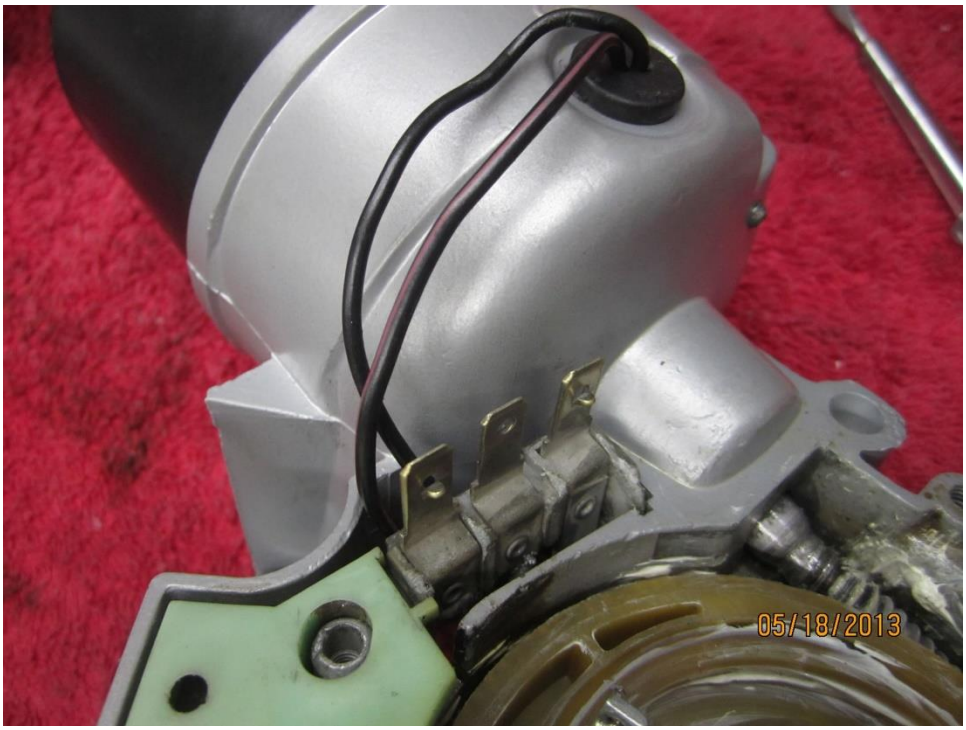
The black wire with the pink stripe goes over to the tab on the underside of the stop relay

The solid black wire goes to the end of the 1-2-3 plug

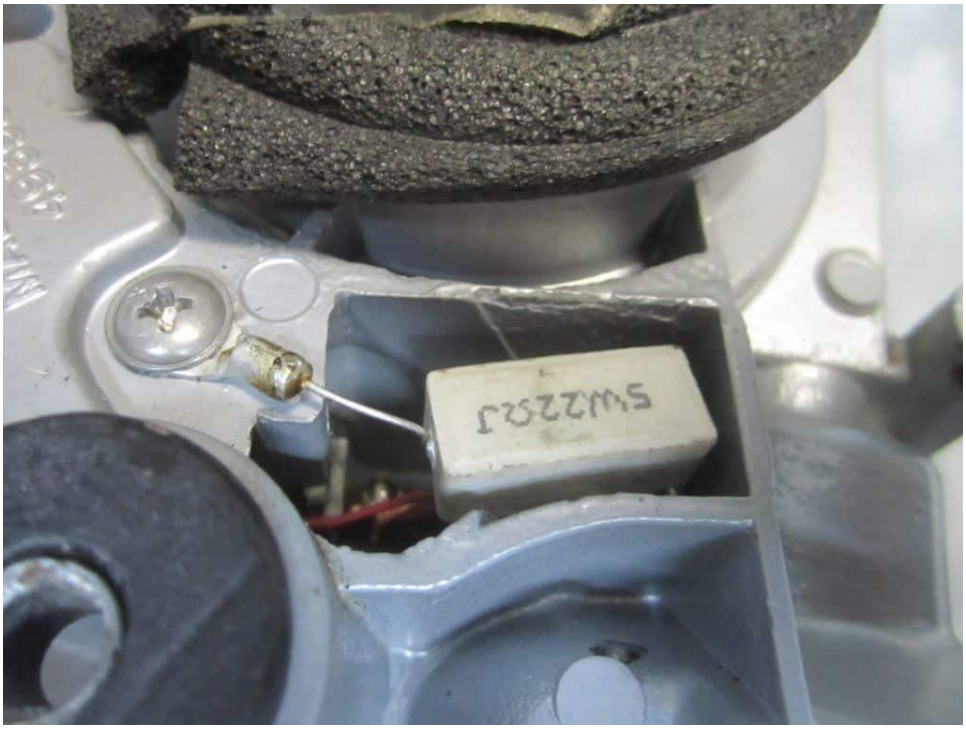


The small red wires both go over to the stop relay and attach to the electro-magnet.

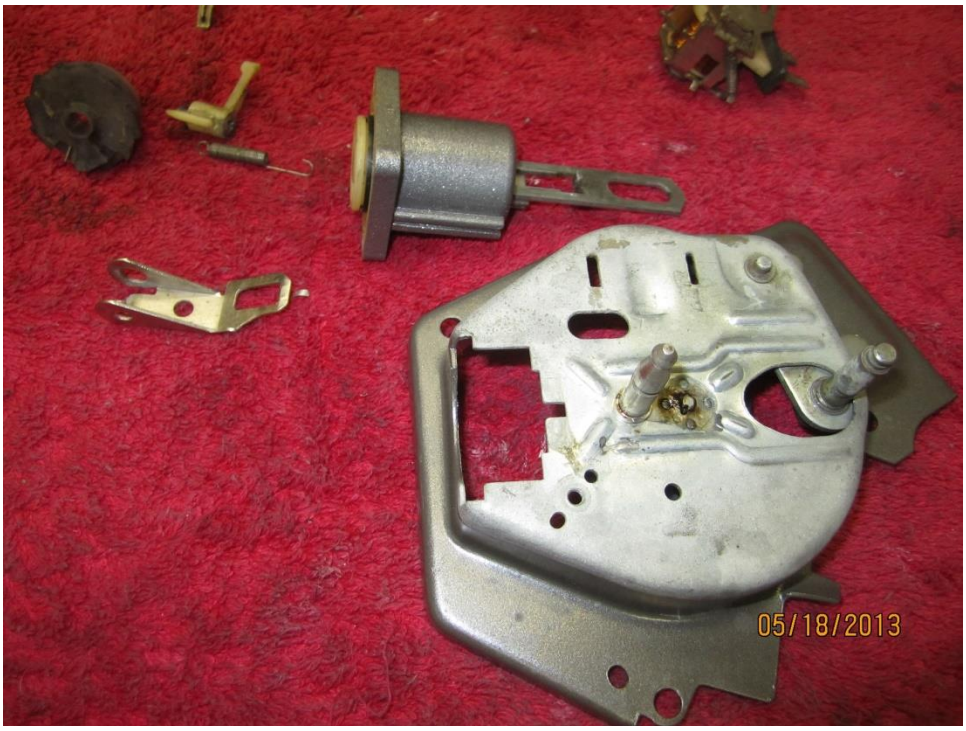
I need to find a new connector, there should be a resistance coil/wire along the back there but I've yet to find one intact for reference.
According to Willcox Corvette, the resistance of the missing bit is approx. -20.6 ohm, I don't know the total resistance in the circuit so it's hard to say the wattage that would be required



A 20 ohm resistor seems to be the correct resistance, but a 5 watt 22 ohm resistor works to replace the missing or damaged wire resistor.

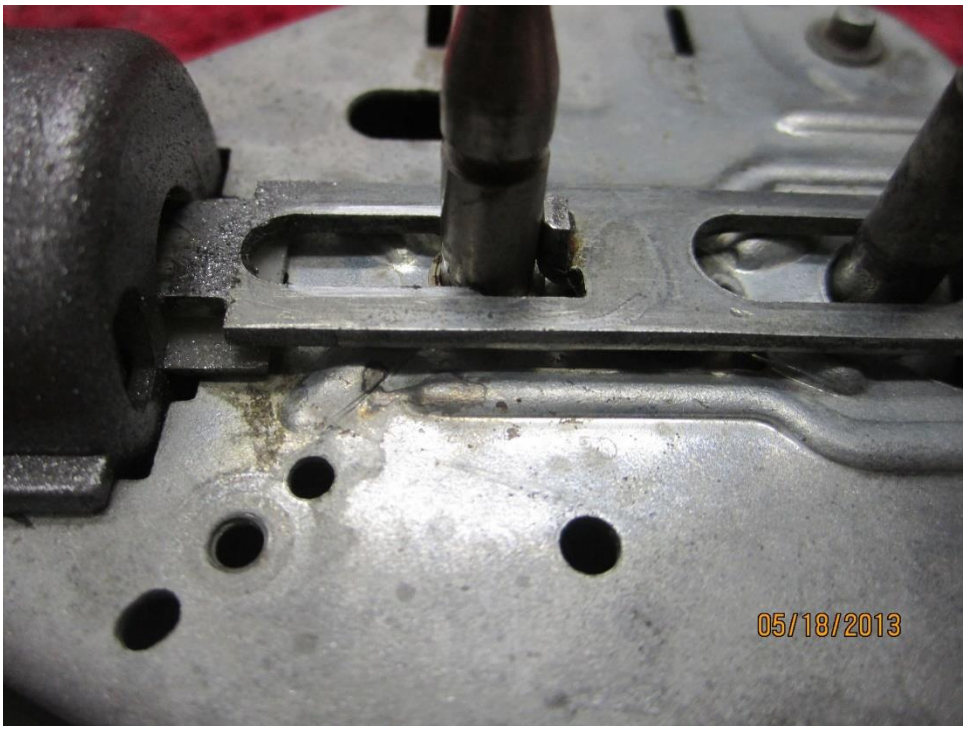


Now for the Pump



Shove the piston in with your thumb and slip the pump into the housing. The pump body has two slots that line up with the housing

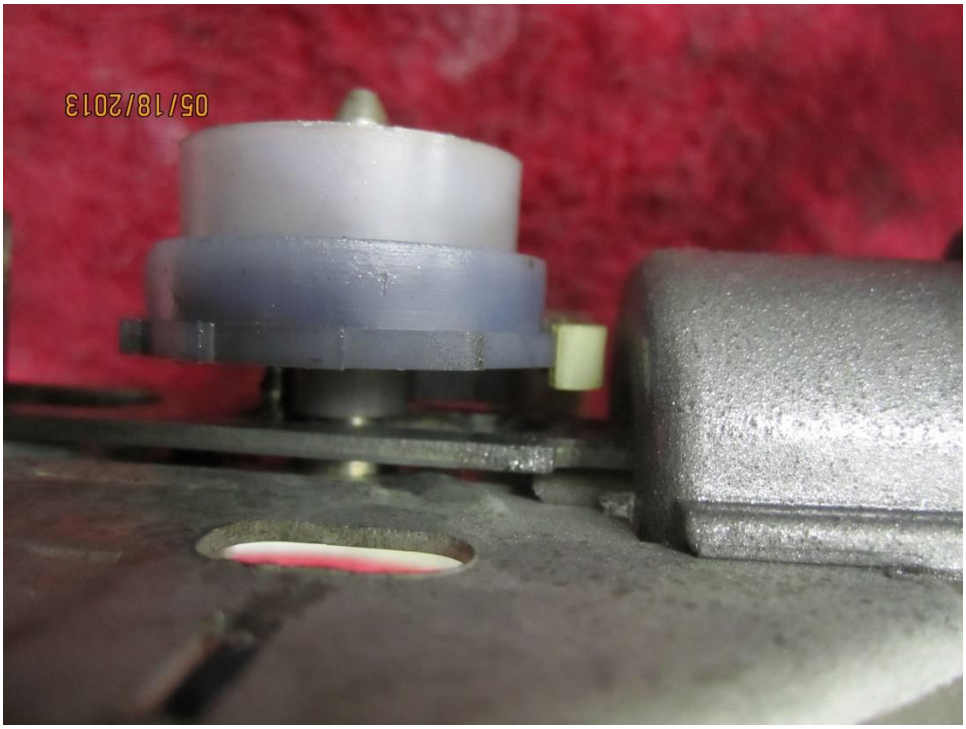
The little tab on the link has to face up



Now's a good a time as any to install the pawl

There are two little alignment pins on either side of the screw to locate it correctly.

Put a drop of grease inside the gear and drop it in place, you need to push the piston in again to move that tab out of the way so the gear drops on fully, also watch for the pawls not to be in the way

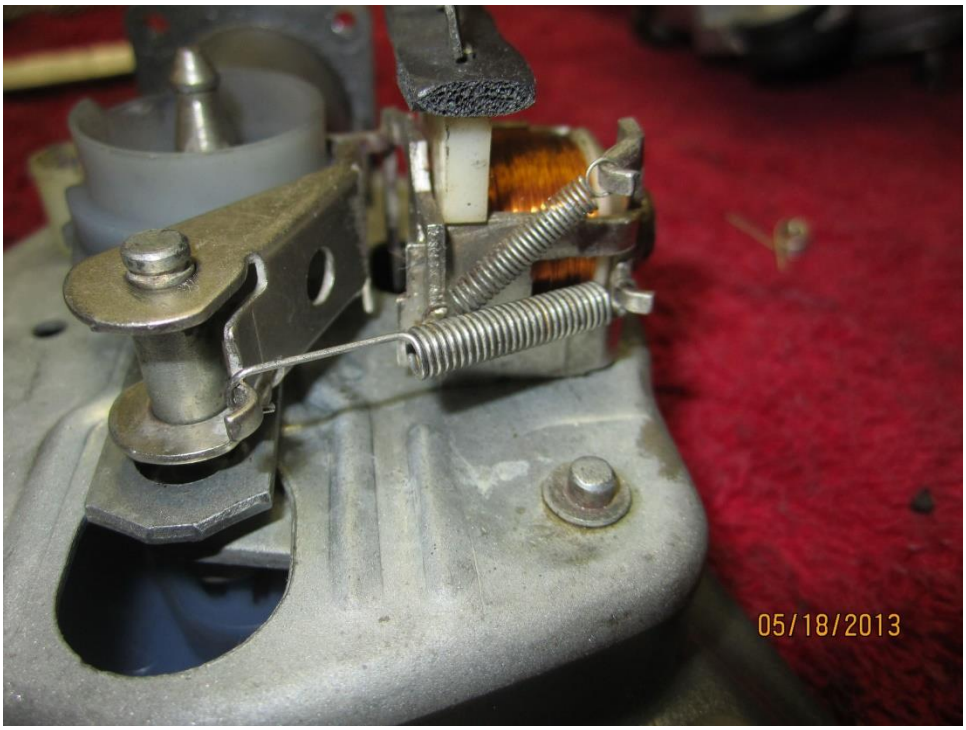


Flip it over and drop the cam wheel onto the shaft and install the locking washer. I use a small socket to press it into place

Put the electromagnet in and use a large screwdriver to spread the tangs locking it firmly in

The ratchet arm can go on, notice in the background the arm for the electromagnet arm riding on the plastic gear

The orientation of the spring for that arm (diagonal) holds it down on the cam track of the gear



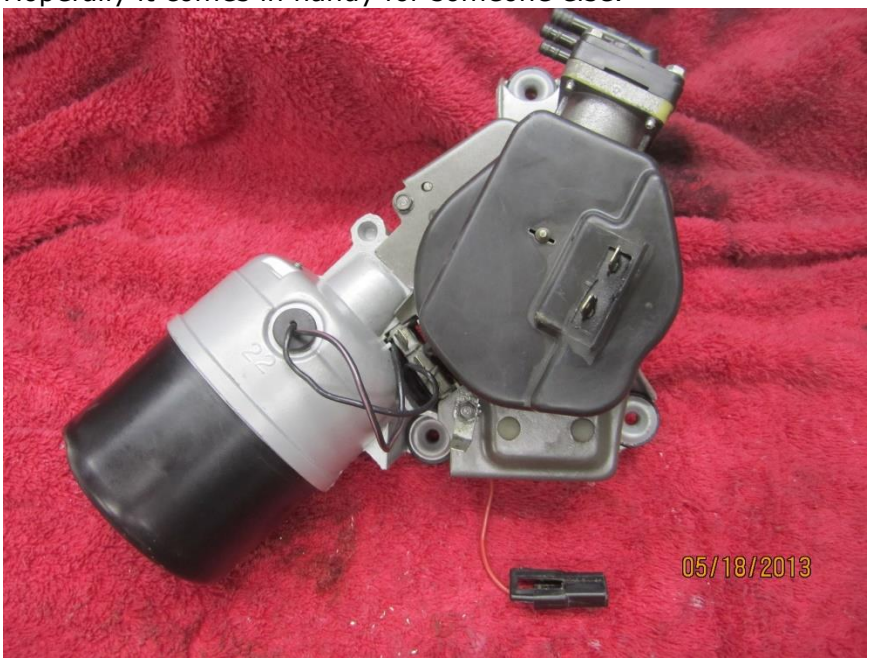
An E-Clip holds the ratchet arm on and a spring holds the plastic gear in place

With the motor in the parked position, turn the cam wheel so the pin on the motor locates in the curved slot (greased in this picture) and put the two parts together and bolt everything up.

When the motor is turning, the ratchet arm is always moving back and forth with the cam wheel but it's not ratcheting the gear ahead, when the washer button is pressed, the electromagnet moves the other arm up and allows the ratchet arm to engage the gear to start turning, the ratchet arm then pulls it around and pumps the pump.
When it makes one full turn the magnet arm drops back into the off spot and it stops the ratchet arm from engaging the gear again.

Anyway, since mine was all torn apart with the wires not connected, and the few images I found were not great, I worked my way through it and came up with this.

Hopefully it comes in handy for someone else.

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